Summary Report No. 15
March 2001

Health Services Utilization and Research Commission

Planning for Saskatchewan's Future: Population and Health Services Projections to 2015

Is Saskatchewan's population growing? Will we have more seniors in the future? How will population changes over time affect the health care system?

To help administrators and decision-makers plan for the future, HSURC projected the provincial population to 2015. The objectives of our study were to forecast the total population for each health district and Saskatchewan as a whole, estimate the number of seniors likely to be living in each health district and province-wide, and identify implications of the changing population for the health care system.

When we set out to calculate population projections for health districts, we examined the "gold standard" methods used by reputable agencies such as Statistics Canada. Because key data are not available at a district level, however, we were unable to apply the same approaches to our project. Instead, we created projections based on the "next best" available method, one that has been used in other Saskatchewan projections, is based on explicit assumptions, and can be readily replicated.

Although population projections are useful tools for planning, they represent estimates only, based on the latest available evidence. Thus, our calculations suggest what the future population will be if current fertility rates and population changes due to migration and mortality continue unchanged for the next 15 years. The mathematical models we used do not adjust the figures for unexpected changes to the population that may result from future economic development or advances in health care. As a result, our projection figures should be considered informed estimates rather than confirmed fact.

Methods

How did we calculate our population projections?

The two key steps in calculating population projections for a jurisdiction are 1) determining how many babies will be born, and 2) determining how many people will come (move in) and go (move out or die) over time. To calculate the number of newborns, we multiplied birth rates (age-gender specific fertility rates) by the number of women of child-bearing age. To project how the population would change over five years, we followed every age group from 1995 to 2000. We assumed that if there were 100 children between the ages of five and nine in 1995, there should be 100 between ages 10 and 14 in 2000. However, some of these 100 individuals may die or move away within the five-year period. Similarly, new residents might move into a district and join the 10-14 age group in 2000.

To account for migration and mortality, we calculated a population change ratio by dividing the number of individuals in a particular age group in 2000 by the number of individuals in the age group five years younger in 1995 (i.e., number in 10-14 age group in 2000/number in 5-9 age group in 1995). A ratio of less than one indicates that some individuals will be lost to the population (through either migration or mortality), while a ratio greater than one indicates the population will increase (because immigration has exceeded mortality and emigration).

For each five-year projection, we applied the same set of fertility rates and population change ratios to the projected population. For example, we multiplied the baseline (2000) population by fertility rates and population change ratios to determine the 2005 projections. The 2005 projected population was multiplied by the same fertility rates and population change ratios to determine the 2010 population, and so on. This method assumes that the fertility rate and population changes seen between 1995 and 2000 will continue unchanged over the next 15 years.

To project future supplies of health services, we calculated current, district-specific rates for acute care beds (number/1,000 population), long-term care beds (number/1,000 population 75+), and home care

clients (number/1,000 population). To project future rates, we multiplied current service levels by projected populations. Because long-term and home care data were not available for the Mamawetan Churchill River, Keewatin Yathé and Athabasca health districts, we used provincial rates for these districts. (For the purpose of this study, we refer to the Athabasca Health Authority as a health district.)

To forecast the provincial population in 2015, we projected then combined districts' populations. Likewise, we projected districts' levels of key health services then aggregated them to determine provincial rates. A detailed description of our methods, as well as a sample spreadsheet that can be used to update the district population projections, is available on our web site at www.hsurc.sk.ca. Summary reports for specific health districts are available on request from HSURC.

What data did we use for our projections?

For our projections, we used data from Saskatchewan Health's Health Insurance Registration File (for district populations), Vital Statistics (for birth rates) and the Acute and Emergency Services and Community Care Branches (for service levels). The department's Health Insurance Registration File, better known as the covered population, is routinely updated and encompasses the population in the province covered under the Saskatchewan Health Insurance Program. It excludes federal inmates, members of the RCMP and Canadian Armed Forces, and individuals who have not met the residency requirement for insurance coverage (i.e., lived in Saskatchewan for three months). Saskatchewan Health determines district populations on the basis of residence codes. A detailed explanation of how the health department "assigns" residents to individual districts is available directly from Saskatchewan Health.

Results

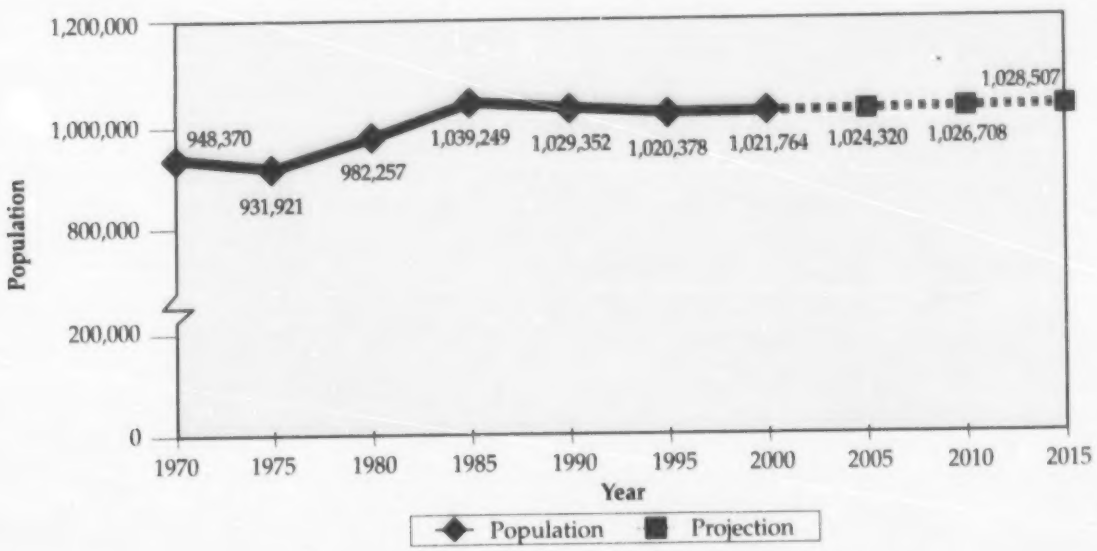
What will Saskatchewan's population be in 2015?

Over the next 15 years Saskatchewan's population will increase by about one per cent, climbing from 1,021,764 in 2000 to 1,028,507 in 2015. Figure 1 summarizes the Saskatchewan population from 1970 to 2015. Table 1 shows a breakdown of the provincial population by five-year age groups, for the period from 2000 to 2015.

How will the populations of individual health districts change over the next 15 years?

In general, the populations of health districts in northern and central Saskatchewan will increase over the next 15 years, while populations of districts in southern Saskatchewan will decrease (see Figure 2). Table 2 presents the district name corresponding to the map numbers, as well as the district popula-

Figure 1: Saskatchewan population, 1970-2015



tions in 2000 and 2015 and percentage change in populations. We calculated percentage changes relative to each district's own population. Thus, while the percent change in a given district may be high, the actual number of individuals that change represents may in fact be small relative to other districts. For example, a 21 per cent population decline in North Valley Health District will mean the loss of 3,025 individuals. A three per cent drop in the Regina Health District, however, represents a decrease of 5,692 individuals.

Is Saskatchewan's seniors population growing?

In 1970 there were 92,895 seniors (65+) in Saskatchewan, comprising almost 10 per cent of the provincial population. That number grew to 147,692 in 2000 (14 per cent of the population) and is projected to decrease slightly by 2005 before climbing to 157,330 (16 per cent of the population) in 2015. Overall, the province will see a seven per cent increase in its seniors population between 2000 and 2015.

The composition of Saskatchewan's seniors population is also projected to change over the next 15 years. Numbers of seniors in the 65-74 and 85+ age groups will rise, while the number in the 75-84 group will fall (Table 3). Seniors in the 65-74 age group, who accounted for 50 per cent of the 65+ population in 2000, will make up 54 per cent by 2015, while the 85+ age group will grow from 14 per cent (in 2000) to 16 per cent of the overall seniors population by 2015. Seniors in the 75-84 age bracket, who accounted for 36 per cent of the overall seniors population in 2000, will constitute 31 per cent of the 65+ population in 2015.

Table 1. Saskatchewan population by age group, 2000-2015

Age group	2000 population	2005 population	2010 population	2015 population
0-4	64,896	67,351	67,979	67,882
5-9	73,942	65,562	67,988	68,640
10-14	79,639	73,221	65,005	67,414
15-19	81,001	79,395	73,051	64,863
20-24	73,798	77,361	76,417	70,526
25-29	64,672	67,710	71,215	70,716
30-34	63,966	62,453	65,476	68,892
35-39	78,938	62,407	60,981	63,977
40-44	80,028	77,130	61,027	59,688
45-49	70,845	78,133	75,318	59,666
50-54	58,274	68,765	75,853	73,141
55-59	45,036	56,081	66,181	72,977
60-64	39,037	42,727	53,212	62,796
65-69	37,743	36,050	39,463	49,179
70-74	35,507	33,468	32,014	35,050
75-79	30,788	29,612	27,946	26,801
80-84	22,842	23,417	22,547	21,277
85-89	13,862	14,747	15,172	14,628
90-94	5,472	6,859	7,421	7,687
95+	1,478	1,870	2,443	2,708
Total	1,021,764	1,024,320	1,026,708	1,028,507

Table 2. Total and seniors populations by health district, 2000 and 2015

No.	District	2000 pop.	2015 pop.	% change pop.	2000 SR (% of district pop.)	2015 SR (% of district pop.)	% change SR pop.
1	South East	24,200	22,574	-7	3,812 (16%)	3,440 (15%)	-10
2	South Central	19,591	17,250	-12	3,811 (19%)	3,359 (19%)	-12
3	South Country	11,514	9,209	-20	2,475 (21%)	1,881 (20%)	-24
4	Rolling Hills	10,950	9,520	-13	2,090 (19%)	1,793 (19%)	-14
5	Southwest	14,818	14,118	-5	2,543 (17%)	2,198 (16%)	-14
6	Moose Mountain	12,777	11,587	-9	2,520 (20%)	2,226 (19%)	-12
7	Pipestone	19,317	18,196	-2	3,664 (19%)	3,250 (17%)	-11
8	Regina	211,733	206,041	-3	26,147 (12%)	29,689 (14%)	+14
9	Moose Jaw-Thunder Creek	45,214	41,729	-8	8,104 (18%)	7,890 (19%)	-3
10	Swift Current	20,257	20,364	+1	3,612 (18%)	3,593 (18%)	-1
11	North Valley	14,393	11,368	-21	3,271 (23%)	2,849 (25%)	-13
12	Touchwood Qu'Appelle	14,764	14,821	0	2,450 (17%)	2,522 (17%)	+3
13	East Central	29,924	28,057	-6	6,075 (20%)	6,983 (25%)	+15
14	Living Sky	13,720	11,736	-14	2,908 (21%)	2,552 (22%)	-12
15	Midwest	17,701	16,529	-7	3,514 (20%)	3,070 (19%)	-13
16	Prairie West	14,460	13,321	-8	2,440 (17%)	1,993 (15%)	-18
17	Assiniboine Valley	16,067	13,930	-13	4,057 (25%)	3,155 (23%)	-22
18	Central Plains	20,788	19,353	-7	4,300 (21%)	3,909 (20%)	-9
19	Saskatoon	237,278	261,004	+10	27,146 (11%)	35,696 (14%)	+31
20	Greenhead	14,916	13,706	-8	2,593 (17%)	2,173 (16%)	-16
21	Pasquia	16,839	14,688	-13	3,259 (19%)	3,074 (21%)	-6
22	North Central	12,113	11,490	-5	2,274 (19%)	2,049 (18%)	-10
23	Gabriel Springs	11,954	13,508	+13	1,976 (17%)	1,942 (14%)	-2
24	North-East	15,890	15,361	-3	2,528 (17%)	2,584 (17%)	-2
25	Prince Albert	56,224	53,458	-5	7,147 (13%)	8,362 (16%)	+17
26	Parkland	20,428	21,522	+5	3,176 (16%)	3,492 (16%)	+10
27	Battlefords	27,854	28,252	+1	4,027 (14%)	4,211 (15%)	+5
28	Twin Rivers	16,672	19,335	+16	2,006 (12%)	2,180 (11%)	+9
29	Lloydminster	10,798	12,288	+14	793 (7%)	945 (8%)	+19
30	Northwest	15,023	17,851	+19	1,373 (9%)	1,570 (9%)	+14
31	Mamawetan Churchill River	20,375	30,285	+49	876 (4%)	1,769 (6%)	+102
32	Keewatin Yatthé	10,931	13,572	+24	530 (5%)	801 (6%)	+51
33	Athabasca	2,281	2,481	+9	95 (4%)	132 (5%)	+39
	Saskatchewan	1,021,764	1,028,507	+1	147,692 (14%)	157,330 (16%)	+7

Will some health districts have more seniors than others?

There will continue to be wide variation among districts in the proportions of seniors in their populations. In 2000, these figures ranged from a low of four per cent, in Athabasca, to a high of 25 per cent, in Assiniboine Valley (Table 2). By 2015, seniors are projected to make up between five per cent (Athabasca) and 25 per cent (North Valley) of districts' overall populations. In coming years, health districts in southern and south central Saskatchewan will have the highest proportions of seniors, while districts in northern Saskatchewan will continue to have the lowest proportions of seniors.

Figure 2: Change in health district population, 2000-2015

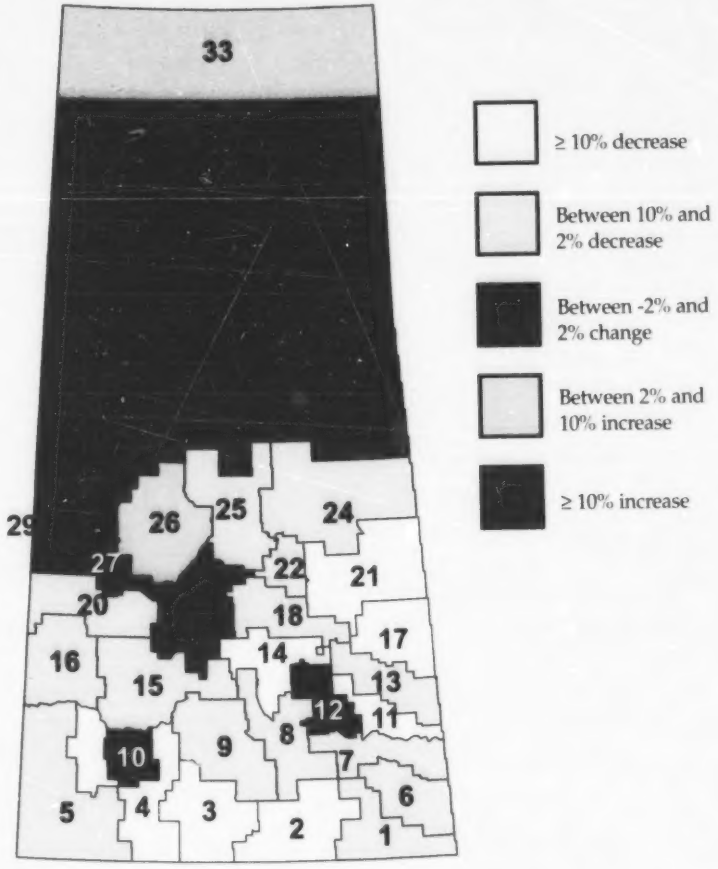


Table 3. Age composition of the seniors population, 2000-2015

Age group	Population (% of seniors population)			
	2000	2005	2010	2015
65-74	73,250 (50%)	69,518 (48%)	71,476 (49%)	84,229 (54%)
75-84	53,630 (36%)	53,029 (36%)	50,492 (34%)	48,079 (31%)
85+	20,812 (14%)	23,475 (16%)	25,036 (17%)	25,022 (16%)
Total	147,692 (100%)	146,022 (100%)	147,005 (100%)	157,330 (100%)

The magnitude of change in seniors populations will vary considerably from district to district (Table 2). The 65+ age group will grow in northern and large urban health districts, but shrink in southern districts. We measured percentage change in seniors populations relative to individual districts' overall seniors population. Thus, while the change in proportion for a given district may be high, the actual number of individuals this change represents may be small relative to other districts. For example, the 102 per cent increase projected for Mamawetan Churchill River Health District will mean the addition of 893 seniors, while the forecasted 14 per cent jump in Regina's seniors population will see 3,542 members join the 65+ age group.

How will the projected changes in population affect levels of key health services?

Based on our projections, Saskatchewan will see a one per cent increase in the number of available acute care beds, a one per cent decrease in long-term care beds, and about the same number of home care clients. Table 4 presents current rates (based on the most recent Saskatchewan Health data) and projected rates for the next 5, 10, and 15 years (based on current levels of service). We made no attempt, as part of this project, to assess whether current supplies of health services are appropriate. (Projections of districts' future supplies of health services are presented in the individual district reports.)

Discussion

What are the implications of projected population changes for health districts?

When health districts were first established in 1993, all but the northernmost districts had the 12,000 population recommended as a minimum by the province. By 2000 six districts had populations of less than 12,000, and three had populations between 12,000 and 14,000 (Table 2). By 2015 seven districts will serve fewer than 12,000 residents and six districts will have populations between 12,000 and 14,000. The increasing number of health districts with small populations renews questions about the minimum viable size for districts. Arguably, districts with small populations may not have the critical mass required to efficiently administer and deliver health services.

Our projections suggest that the province's seniors population is not only growing, but that its composition and distribution across districts are also changing. The health care needs of seniors vary by age and differ from the needs of the general population. Forecasted changes in the size and composition of the seniors populations will demand different mixes of health care services targeted to seniors and suggest there will be potential for reallocating and redistributing resources at a district level.

What are the limitations to our projections?

Although the absence of district-level data precluded our using the same projection method employed by agencies such as Statistics Canada, we're confident our approach yielded a reasonably reliable estimate of future populations that constitutes a sound basis for planning.

All projection methods assume that birth, death, and migration patterns remain constant over the duration of the forecast period. Thus, the longer the period of time over which you attempt to make projections, the more uncertainty there is likely to be in estimate figures.

Furthermore, our projections cannot account for potential changes in economic development or health care that may produce substantial changes in migration and mortality rates. Economic development is a key consideration in population projections. For example, although we project that the population of northern health districts will increase over the next 15 years, it is likely some residents will in fact move elsewhere if there is not sufficient economic development in the region. Health districts, therefore, should routinely monitor their populations and update their projections—particularly if local migration patterns change.

Table 4. Future levels of health services, based on current rates

Resource and current service level	Current number	Projected number 2005	2010	2015
Acute beds: 2.9 beds/1000[1,2]	2,939	2,946	2,952	2,954
Long-term care beds: 121.6 clients/1000 75+[2,3,4]	8,988	9,297	9,171	8,869
Home care: 28.0 clients/1000 (all levels)[5,6]	29,102	29,383	29,294	29,206

1 Excludes rehabilitation beds, psychiatric beds, newborn bassinettes, and beds in the Wascana Rehabilitation Centre.
2 Based on 2000 figures.
3 Excludes beds in the Wascana Rehabilitation Centre.
4 Calculations of current service levels exclude Mamawetan Churchill River, Keewatin Yatthé, and the Athabasca health districts because of the small number of long-term care beds in these districts. Projections, however, include the three districts.
5 Based on 1998/99 figures.
6 Calculations of current service levels exclude Mamawetan Churchill River, Keewatin Yatthé, and the Athabasca health districts because home care programs are delivered in these regions by both the provincial and federal governments. Projected service levels, however, include these districts (and therefore assume that the provincial government would deliver the service).

We used Saskatchewan Health's covered population database to measure the provincial population. This database, although updated daily, captures the number of individuals with valid Saskatchewan health cards—not the actual number of people living in the province at any given time. Thus, it may include individuals who no longer reside in Saskatchewan but who have not updated their health insurance coverage.

In addition, the information within the database does not necessarily reflect the number of individuals actually served by a health district. It may underestimate the population in districts with large numbers of temporary residents (such as post-secondary students and seasonal workers). For districts with communities near provincial borders, this database may either over- or underestimate the populations actually served by the health district. It would likely underestimate the number of people served by the Lloydminster Health District, for example, because that district provides services to both Saskatchewan and Alberta residents.

Finally, we recognize that projections around the aboriginal population would be useful information for district planners. The data available cover the Registered Indian population only (versus the aboriginal population as a whole), however, and are of poor quality. As a result, we elected not to report projections for this population group.

Conclusions

Saskatchewan's population will grow over the next 15 years, with populations of individual health districts changing in terms of both size and age composition. In general, populations of districts in northern and central Saskatchewan will increase, while populations of districts in southern Saskatchewan will decrease. Although the number of seniors in northern and large urban health districts will rise, their numbers will fall in southern health districts. Seniors aged 65-74 and 85+ will comprise larger proportions of the seniors population in 2015 than they do in 2000; the proportion of seniors in the 75-84 age group will decrease.

Our projections suggest that by 2015 there will be a greater number of health districts in Saskatchewan that—because of their small population size—may lack the critical mass necessary to efficiently administer and deliver health services. Although it appears likely that numbers of acute and long-term care beds and home care clients will remain somewhat stable provincially, projected changes in the size and composition of district populations suggest there may be opportunities to redistribute resources at a local level. We emphasize again that allocation of resources should be determined at the district level, based on a more detailed assessment of need.

Recommendations

Based on our findings, we make the following recommendations:

Saskatchewan Health and health districts

Both the province and health districts should monitor district population size and composition.

Population size is highly dependent upon economic development. Regular monitoring of current populations and updating of projections is essential for planning health services.

Health districts

Health districts should assess current service levels (numbers of acute and long-term care beds and home care clients) relative to current and projected needs before changing supplies of these services.

In identifying potential implications of projected changes to populations, we have assumed—for the sake of these calculations—that current service levels are appropriate. Rather than change programs or resources solely on the basis of these population projections, health districts should first assess the degree to which their local needs are being met through existing services.

Saskatchewan Health

Saskatchewan Health should monitor district size to ensure that there is critical capacity to efficiently administer and deliver health services.

Several districts have populations hovering near the 12,000 minimum identified by the province in 1993. Districts with such small populations may be unable to administer and deliver health services in an efficient manner.

Saskatchewan Health should work with aboriginal groups to improve the quality of data on aboriginal peoples.

Although aboriginal people form a substantial proportion of the provincial population, reliable, valid data on this group are limited. Moreover, the available data do not permit reliable analysis at a district level. Saskatchewan Health, in partnership with aboriginal groups, should identify strategies to improve the data on aboriginal peoples and their need for health services.

Study working group

The HSURC board functioned as the study working group for this project: Liz Harrison (Chair), Gord Asmundson, Dan de Vlieger, Irene Denis, Marianne Hodgson, James Irvine, Gordon Johnson, Barry Maber (Vice-Chair), Robert McCulloch, Jean Morrison, and Jeff Taylor.

HSURC staff involved in the project were Maria Mathews (researcher and team leader); Dianne Ferguson (research transfer); Michaela Berkowitz (research assistant); Greg Basky (communications manager); Laurie Thompson (advisor); Heather MacDonald (internal reader); Barb Nisbet, Val Ziegler, and Carrie Churko (communications support).

Acknowledgements

HSURC would like to thank the following agencies/individuals for their input on and support of the project:

- Val Phillips, Sheena McRae, Tania Trofimuk, Lorena Rostie, and Rob Anderson, Corporate Information and Technology Branch, Saskatchewan Health
- John Mowbray, Community Care Branch, Saskatchewan Health
- Brian Johnson, Acute and Emergency Services Branch, Saskatchewan Health
- The seven external reviewers from across Canada who provided comments on an earlier draft of this report.

Disclaimer

Although Saskatchewan Health provided data for this project, the views expressed in this report do not necessarily represent its official policy.

Similarly, the views expressed in this report do not necessarily represent the views of our external readers.

Suggested citation format

Health Services Utilization and Research Commission. Planning for Saskatchewan's Future: Population and Health Services Projections to 2015. Summary Report. Saskatoon: HSURC, March 2001.

Further Information

Additional printed copies of this report, as well as reports for individual districts, are available. To order, please contact:

Health Services Utilization and Research Commission
Box 46, 103 Hospital Drive
Saskatoon, SK S7N 0W8
Telephone: (306) 655-1500; fax (306) 655-1462; e-mail: zieglerv@hsurc.sk.ca

This report and a companion document detailing our study methods are available on the HSURC web site: www.hsurc.sk.ca.